

introduction of new matter. Favorable reconsideration of the application as now amended is respectfully solicited.

Claims 1 through 3, 5, 6 and 13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the Kinoshita publication (hereinafter "Kinoshita") of record in view of JP 6-276154 (hereinafter "Inoue"), as set forth at paragraph 1 of the Office Action. Favorable reconsideration and withdrawal of this rejection in light of the following comments are respectfully solicited.

Independent claim 1 as now amended recites, *inter alia*, the following:

an optical filter capable of changing a gradient $dL/d\lambda$ of a loss L (dB) with respect to a wavelength λ (nm) in the predetermined wavelength band;

... and

control means for controlling an optical pumping light output from said optical pumping light source such that light power after amplification has a predetermined target value, and for adjusting the gradient $dL/d\lambda$ of said optical filter.

The Office Action recognizes that Kinoshita does not "teach a filter capable of adjusting a gradient of loss with respect to wavelength." To meet this requirement of claim 1, the Office Action concludes that "[i]t would have been obvious to modify Kinoshita . . . by substituting the VOA of Inoue . . . for the VOA of Kinoshita . . . in order to provide dynamic gain-flattening by controlling the transmission slope of the VOA to reduce tilt." However, there are significant differences between the claimed invention and the cited reference disclosures. At the outset, it should be noted that the Mach-Zehnder filter used in Inoue is a gain equalizer (GEQ), not a VOA. The Office Action has provided no reason why a person of ordinary skill in the art would have found it obvious to substitute a GEQ for Kinoshita VOA.

Moreover, it is submitted that the optical filter of the present invention is neither a VOA nor a GEQ. In the claimed invention, this optical filter is used for dynamically compensating the fluctuation of wavelength-dependent gradient in the optical amplification caused by the fluctuation of signal light level or numbers of signal light. While Kinoshita also discloses an AGC, its use of the AGC is contradictory to changing the gradient as required by the claimed invention. Thus, even if through hindsight the artisan were to make the substitution posed in the Office Action, the resulting combination would not meet the requirements of independent claim 1 and its dependent claims 2, 3, 6 and 13.

Claim 12, dependent from claim 2, has been rejected under 35 U.S.C. §103(a) as being unpatentable over Kinoshita in view of Inoue, as applied to independent claim 1 and discussed above, and further in view of Clapp, of record. Clapp has been relied upon, not for teaching the gradient changing feature of claim 1, but for concluding that it would have been obvious to set a balance point for the Inoue filter in the predetermined band. It is submitted, therefore, that claim 12 is patentably distinguishable over the applied references. Withdrawal of the rejection is respectfully solicited.

Claim 4, dependent from claim 1, has been rejected under 35 U.S.C. §103(a) as being unpatentable over Kinoshita in view of Inoue, as applied to independent claim 1 and discussed above, and further in view of Okuno, of record. Okuno has been relied upon, not for teaching the gradient changing feature of claim 1, but for concluding that it would have been obvious to include a channel counting device in the control apparatus. It is submitted, therefore, that claim 4 is patentably distinguishable over the applied references. Withdrawal of the rejection is respectfully solicited.

Claim 7, dependent from claim 1, has been rejected under 35 U.S.C. §103(a) as being unpatentable over Kinoshita in view of Inoue, as applied to independent claim 1 and discussed above, and further in view of the Inoue publication, of record. The Inoue publication has been relied upon, not for teaching the gradient changing feature of claim 1, but for concluding that it would have been obvious to substitute a spectrum monitoring means for the non-described detection means in the other references. It is submitted, therefore, that claim 7 is patentably distinguishable over the applied references. Withdrawal of the rejection is respectfully solicited.

Claim 8, dependent from claim 7, has been rejected under 35 U.S.C. §103(a) as being unpatentable over Kinoshita in view of Inoue, as applied to independent claim 1 and discussed above, and further in view of Okuno, of record, and yet further in view of Naito et al. Okuno has been relied upon, not for teaching the gradient changing feature of claim 1, but for concluding that it would have been obvious to include a channel counting device in the control apparatus. Naito has been relied upon, not for teaching the gradient changing feature of claim 1, but for concluding that it would have been obvious to add to the combination of other references a means for receiving information related to the shortest and the longest wavelengths. It is submitted, therefore, that claim 4 is patentably distinguishable over the applied references. Withdrawal of the rejection is respectfully solicited.

Claim 9, dependent from claim 1, has been rejected under 35 U.S.C. §103(a) as being unpatentable over Kinoshita in view of Inoue, as applied to independent claim 1 and discussed above, and further in view of Taylor, of record. Taylor et al. has been relied upon, not for teaching the gradient changing feature of claim 1, but for concluding

that it would have been obvious to "modify the apparatus by substituting [an] ASE monitor." It is submitted, therefore, that claim 9 is patentably distinguishable over the applied references. Withdrawal of the rejection is respectfully solicited.

Claims 10 and 11, dependent from claim 1, have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kinoshita in view of Inoue, as applied to independent claim 1 and discussed above, and further purportedly in view of the Kinoshita patent, of record. However, the description of the rejection (paragraph 7 of the Office Action) refers to Taylor, not the Kinoshita patent. In either event, the tertiary reference has not been relied upon by the Office Action for teaching the gradient changing feature of independent claim 1. It is submitted, therefore, that claims 10 and 11 are patentably distinguishable over the applied references. Withdrawal of the rejection is respectfully solicited.

Claims 14 through 16 and 25 (and, presumably, claims 26 and 27) have been rejected under 35 U.S.C. §103(a) as being unpatentable over Maxham, of record, in view of Inoue. Claim 14 is an independent method claim from which claims 15, 16 and 25 depend. Claim 14 recites, *inter alia*, the following:

. . . adjusting the gradient $dL/d\lambda$ of the optical filter to reduce a inherent wavelength-dependent gradient in the optical amplification

As recognized in the Office Action, Maxham does not disclose or suggest this feature. While Inoue has been relied upon for modifying the method of Maxham, the Mach-Zehnder filter used in Inoue is a gain equalizer (GEQ) that is not used for dynamically compensating the fluctuations of wavelength-dependent gradient in the optical amplification caused by the fluctuations in the signal light level or numbers of signal light. The artisan thus would not have been led to the claim requirements by

consideration of the applied references. It is submitted, therefore, that claims 14 through 16 and 25 through 27 are patentably distinguishable over the applied references.

Withdrawal of the rejection is respectfully solicited.

Claim 17, dependent from claim 14, has been rejected under 35 U.S.C. §103(a) as being unpatentable over Maxham in view of Inoue, as applied to independent claim 14 and discussed above, and further in view of Okuno. Okuno has been relied upon, not for teaching the gradient changing feature of claim 14, but for concluding that it would have been obvious to include a channel counting device in the control apparatus. It is submitted, therefore, that claim 17 is patentably distinguishable over the applied references. Withdrawal of the rejection is respectfully solicited.

Claim 18 dependent from claim 14, has been rejected under 35 U.S.C. §103(a) as being unpatentable over Kinoshita in view of Inoue, as applied to independent claim 14 and discussed above, and further in view of Taylor, of record. Taylor et al. has been relied upon, not for teaching the gradient changing feature of claim 1, but for concluding that it would have been obvious to adjust a filter according to the detected light power. It is submitted, therefore, that claim 9 is patentably distinguishable over the applied references. Withdrawal of the rejection is respectfully solicited.

Claims 20 and 21, dependent from claim 14, have been rejected under 35 U.S.C. §103(a) as being unpatentable over Maxham in view of Inoue, as applied to independent claim 14 and discussed above, and further in view of Naito et al., of record. Naito et al. has not been relied upon by the Office Action for teaching the gradient changing feature of independent claim 14, but to conclude that it would have been obvious to monitor a shortest and a longest signal light. It is submitted, therefore, that claims 20 and 21 are

patentably distinguishable over the applied references. Withdrawal of the rejection is respectfully solicited.

Claims 22 through 24, dependent from claim 14, have been rejected under 35 U.S.C. §103(a) as being unpatentable over Maxham in view of Inoue, as applied to independent claim 14 and discussed above, and further in view of the Kinoshita patent. The rejection rationale is not understood with respect to claim 22 for the reason that the explanation thereof in the Office Action is directed to Clapp, not Kinoshita. Clapp has not been relied upon by the Office Action for teaching the gradient changing feature of independent claim 14, but to conclude that it would have been obvious to adjust ASE. With respect to claims 23 and 24, Kinoshita has been relied upon only for teaching ASE detection. It is submitted, therefore, that claims 22 through 24 are patentably distinguishable over the applied references. Withdrawal of the rejection is respectfully solicited.

Newly added claims 28 through 31 all require adjusting the gradient $dL/d\lambda$ of the optical filter to reduce an inherent wavelength-dependent gradient in the optical amplification. It is submitted that these claims are patentably distinguishable from the references of record for the same reasons as set forth above with respect to claims 1 through 27.

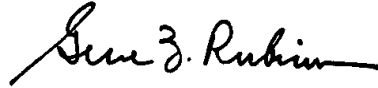
Accordingly, allowance of the present application is respectfully solicited. To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including

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extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Gene Z. Robinson", with a stylized flourish at the end.

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Please amend claims 1 and 14 as follows:

1. (Amended) An optical amplifier for amplifying, at once, multiplexed signal light belonging to a predetermined wavelength band, in which a plurality of signal light components having different wavelengths are multiplexed, comprising:

one or a plurality of optical amplification sections each of which has an optical waveguide doped with a fluorescent material and amplifies the multiplexed signal light by optical pumping of the fluorescent material;

an optical pumping light source for supplying predetermined optical pumping light to said optical amplification section;

an optical filter capable of changing a gradient $dL/d\lambda$ of a loss L (dB) with respect to a wavelength λ (nm) in the predetermined wavelength band; and

control means for controlling an optical pumping light output from said optical pumping light source such that light power after amplification has a predetermined target value, and for adjusting [a characteristic of said optical filter to adjust a final gain characteristic] the gradient $dL/d\lambda$ of said optical filter.

14. (Amended) An optical amplification method of amplifying, at once, multiplexed signal light belonging to a predetermined wavelength band, in which a plurality of signal light components having different wavelengths are multiplexed, comprising the steps of:

guiding the multiplexed signal light to an optical waveguide doped with a fluorescent material together with predetermined optical pumping light and optically amplifying the multiplexed signal light;

guiding at least one of the multiplexed signal light before amplification and that after amplification to an optical filter capable of changing a gradient $dL/d\lambda$ of a loss L (dB) with respect to a wavelength λ (nm) in the predetermined wavelength band and adjusting the gradient $dL/d\lambda$ of the optical filter to reduce a inherent wavelength-dependent [gain] gradient in the optical amplification; and

adjusting an intensity of the optical pumping light to adjust light power after amplification to a predetermined target value.